THE INFLUENCE OF ENVIRONMENTAL CORPORATE SOCIAL RESPONSIBILITY (ECSR), GREEN SUPPLY CHAIN MANAGEMENT (GSCM), AND SUPPLY CHAIN DIGITALIZATION (SCD) ON GREEN COMPETITIVENESS THROUGH THE MEDIATION OF TOP MANAGEMENT COMMITMENT IN MSMES IN INDONESIA

Achmarul Fajar[1]
University of Madura, Pamekasan, Indonesia
achmarulfajar2018@gmail.com

Sukma Umbara Tirta Firdaus[2]
University of Madura, Pamekasan, Indonesia
sukma@unira.ac.id

Putri Fatimah[3]
University of Madura, Pamekasan, Indonesia
Putri_Fatimah@yahoo.co.id

Ayunida Retno Megarani[4]
University of Madura, Pamekasan, Indonesia
Ayunida_Megarani@yahoo.co.id

Diana Afriliana[5]
University of Madura, Pamekasan, Indonesia
Diana_Afriliana@yahoo.co.id

Abstract

This study investigates the impact of Environmental Corporate Social Responsibility (ECSR), Green Supply Chain Management (GSCM), and Supply Chain Digitalization (SCD) on Green Competitiveness (GCA), with Top Management Commitment (TMC) as a mediating variable, in the context of MSMEs in Indonesia. A quantitative research approach is employed, using a structured questionnaire distributed to 490 MSME managers in the districts of Pamekasan and Sampang. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through WarpPls software to explore direct, indirect, and mediating relationships between the variables. The findings show that ECSR, GSCM, and SCD significantly influence GCA, with TMC acting as a significant mediator that strengthens these relationships. Additionally, the results highlight the critical role of TMC in facilitating the successful integration of environmental and digital supply chain practices in enhancing green competitiveness. This study contributes to the body of knowledge by integrating ECSR, GSCM, and SCD with TMC in a comprehensive model that addresses the research gap in understanding the synergy between these practices in MSMEs. The study provides practical insights for MSMEs on how to strategically align environmental practices and digital transformation to enhance competitiveness. Future research should explore additional variables such as organizational culture or external market factors.

Keywords: Environmental Corporate Social Responsibility; Green Supply Chain Management; Supply Chain Digitalization; Top Management Commitment; Green Competitive Advantage

INTRODUCTION

In the current global business landscape, small and medium-sized enterprises (SMEs) in Indonesia face increasing pressure to integrate sustainability into their business strategies. This is particularly crucial as environmental concerns and corporate responsibility have become significant determinants of competitive advantage (Nurasyiah et al., 2024). SMEs are increasingly expected to adopt practices such as Environmental Corporate Social Responsibility (ECSR), Green Supply Chain Management (GSCM), and Supply Chain Digitalization (SCD) to ensure long-term sustainability and maintain competitive positioning (Shandy et al., 2023; Ahmed et al., 2023). These practices not only enhance a firm's environmental performance but also contribute significantly to its overall competitiveness in the market (Wang & Prajogo, 2024; Li et al., 2023).

Environmental Corporate Social Responsibility (ECSR) is a vital concept that encourages companies to incorporate ecological concerns into their core operations and business models (Rehman et al., 2024). By aligning corporate operations with environmentally sustainable practices, firms aim to reduce their ecological footprint while boosting their green competitiveness. Green Supply Chain Management (GSCM) complements this by focusing on improving resource efficiency and minimizing environmental impacts throughout the supply chain (Chatzoudes & Chatzoglou, 2023; Khaksar et al., 2016). Furthermore, Supply Chain Digitalization (SCD) has emerged as a critical enabler, facilitating seamless integration of digital technologies to improve supply chain efficiency and environmental performance (Zhou et al., 2023).

However, these environmental practices cannot reach their full potential without the active commitment of top management. Top Management Commitment (TMC) plays a pivotal role in shaping the direction and success of sustainability initiatives within SMEs (Banerjee, 2002; Liu, 2024). Without a strong commitment from leadership, strategies like ECSR, GSCM, and SCD may not yield substantial improvements in environmental or business performance (Shaikh et al., 2024).

Despite extensive research on the individual impacts of ECSR, GSCM, and SCD, there is a significant gap in understanding how these approaches can be effectively integrated to foster green competitiveness in SMEs, particularly within the Indonesian context. SMEs often face resource constraints and limited managerial capacity, making the role of top management commitment even more crucial in driving these initiatives successfully (Fajar, 2024). Therefore, this study aims to explore the combined impact of ECSR, GSCM, and SCD on green competitiveness, with TMC acting as a mediating variable.

The research will employ a quantitative approach, using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships between these variables in SMEs located in Pamekasan and Sampang. This approach allows for the simultaneous analysis of direct, indirect, and mediated effects, providing a comprehensive understanding of the factors that drive green competitiveness in SMEs (Zainurrafiqi et al., 2024).

This study is expected to contribute to the literature on green supply chain management and sustainable business practices by offering empirical evidence on the interdependencies between ECSR, GSCM, SCD, and TMC. Additionally, it will provide valuable insights for policymakers and SME managers, particularly in Indonesia, on how to

align environmental sustainability with business competitiveness. The study also aims to bridge the research gap by proposing a model that integrates these strategies under the leadership of top management, emphasizing the role of sustainability in improving business performance and competitiveness (Saeed, 2024).

REVIEW OF LITERATURE

Environmental Corporate Social Responsibility (ECSR)

Environmental Corporate Social Responsibility (ECSR) refers to a company's commitment to reducing its environmental impact through sustainable practices. It includes strategies that go beyond compliance with environmental regulations, aiming to make a positive contribution to environmental preservation (Jabbour et al., 2019). For example, companies may invest in renewable energy, reduce waste through recycling, or partner with local communities on environmental initiatives (Rehman et al., 2024). The integration of ECSR into business practices has been shown to positively influence a company's environmental performance and, ultimately, its competitiveness (Ali et al., 2021).

Green Supply Chain Management (GSCM)

Green Supply Chain Management (GSCM) is a management approach that incorporates environmental considerations into supply chain processes (Zhang et al., 2023). The implementation of GSCM can lead to reduced operational costs, improved brand image, and increased competitive advantage by addressing environmental concerns throughout the supply chain (Khaksar et al., 2016). Research has demonstrated that adopting GSCM practices such as eco-design, green purchasing, and environmentally friendly logistics can improve both the sustainability and the financial performance of companies (Waris et al., 2024).

Supply Chain Digitalization (SCD)

Supply Chain Digitalization (SCD) refers to the integration of digital technologies such as big data, IoT, and AI into supply chain processes to improve efficiency and visibility (Zhou et al., 2023). Digitalization facilitates real-time tracking, enhances decision-making, and optimizes resource allocation, thereby improving supply chain efficiency and responsiveness (Shandy et al., 2023). The integration of digital technologies can help companies reduce environmental impact by optimizing resource use, improving waste management, and minimizing emissions (Wang et al., 2024).

Top Management Commitment (TMC)

Top Management Commitment (TMC) is critical in driving sustainable practices within a company. Studies have shown that organizations with strong commitment from their top management are more likely to adopt and implement sustainability strategies effectively (Hossain et al., 2023). TMC has been recognized as a mediator in fostering the success of ECSR, GSCM, and SCD by aligning strategic goals with sustainability objectives and ensuring that resources are allocated for green initiatives (Iqbal et al., 2023).

Green Competitive Advantage (GCA)

Green Competitive Advantage (GCA) refers to the competitive edge a company gains by adopting environmentally sustainable practices, which enhance its brand reputation and operational efficiency (Sharma et al., 2021). The literature suggests that companies that integrate green practices into their operations not only comply with regulations but also position themselves as leaders in environmental sustainability, which helps them attract environmentally conscious consumers and partners (Mishra et al., 2023).

Hypothesized Relationships

1. **ECSR and TMC**

   ECSR practices encourage managers to align corporate goals with environmental objectives, which require strong leadership commitment (Hossain et al., 2023). Therefore, we hypothesize that ECSR will positively influence TMC, as management is more likely to support green initiatives when they see the value in long-term environmental sustainability (Jabbour et al., 2019).

   H1: ECSR has a significant positive effect on Top Management Commitment (TMC).

2. **GSCM and TMC**

   The adoption of GSCM requires support from top management to ensure the integration of green practices across the supply chain (Zhang et al., 2023). Strong leadership commitment is crucial for overcoming barriers such as high initial costs and resistance to change (Khaksar et al., 2016).

   H2: GSCM has a significant positive effect on TMC.

3. **SCD and TMC**

   SCD involves technological investments that require strategic vision and leadership commitment (Zhou et al., 2023). Thus, we hypothesize that top management's commitment to technology adoption is essential for the successful integration of digital tools into the supply chain.

   H3: SCD has a significant positive effect on TMC.

4. **ECSR and GCA**

   ECSR practices contribute to a company's green image and environmental performance, which can enhance its competitive advantage (Ali et al., 2021). By integrating sustainability into their operations, firms can attract environmentally conscious customers, leading to improved GCA.

   H4: ECSR has a significant positive effect on Green Competitive Advantage (GCA).

5. **GSCM and GCA**

   GSCM practices, such as green procurement and eco-design, contribute to reducing operational costs and improving environmental performance, which enhance GCA (Khaksar et al., 2016). Firms that adopt GSCM can leverage their eco-friendly supply chains to improve their competitive position in the market.

   H5: GSCM has a significant positive effect on GCA.

6. SCD and GCA

Digitalization in the supply chain improves operational efficiency and reduces costs, which can enhance a firm's competitive position (Wang et al., 2024). SCD can lead to greater innovation and differentiation, helping firms achieve GCA.

H6: SCD has a significant positive effect on GCA.

7. TMC and GCA

TMC plays a crucial role in shaping the sustainability strategies of an organization. When top management commits to sustainability, it can help drive initiatives that lead to enhanced green competitiveness (Iqbal et al., 2023).

H7: TMC has a significant positive effect on GCA.

RESEARCH METHOD

Research Design

This study adopts a quantitative research approach to explore the impact of Environmental Corporate Social Responsibility (ECSR), Green Supply Chain Management (GSCM), and Supply Chain Digitalization (SCD) on Green Competitive Advantage (GCA) in Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. Specifically, the study investigates the role of Top Management Commitment (TMC) as a mediating variable in strengthening these relationships. A structured questionnaire was distributed to 490 MSME managers in the districts of Pamekasan and Sampang. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), with WarpPls software, to explore both direct and indirect effects of the variables.

Participants/Sample

The research focuses on MSME managers in the districts of Pamekasan and Sampang. These regions were chosen because of the prominence of MSMEs in the local economy, with a unique context in terms of business sustainability and digital supply chain management. The total sample size for the study is 490 respondents, selected using a purposive sampling technique. The inclusion criteria required that respondents be managers or owners of MSMEs who had at least five years of operational experience. This ensures that the respondents have a sufficient understanding of the strategic decisions impacting the business, particularly related to sustainability and digitalization (Fajar et al., 2024).

Instruments

A structured questionnaire was developed based on validated scales from previous research. The questionnaire was designed using a five-point Likert scale, ranging from 1 ('strongly disagree') to 5 ('strongly agree'), ensuring clear responses for statistical analysis (Hair et al., 2017). The questionnaire covers the following variables:

ECSR: Environmental corporate responsibility practices were measured based on philanthropy, community involvement, and customer environmental welfare (Rehman et al., 2024; Waris et al., 2024). GSCM: Green supply chain management practices, including green purchasing, internal environmental management, and eco-design practices (Khaksar et al., 2016; Zhang et al., 2023). SCD: The extent to which digital technologies are integrated into the supply chain, including the use of advanced technologies for process optimization and decision-making (Wang & Prajogo, 2024). TMC: Top Management Commitment was

measured through indicators of management's focus on green competitive advantage, commitment to sustainability goals, and involvement in green practices (Iqbal et al., 2023; Shaikh et al., 2024). GCA: Green Competitive Advantage was assessed based on the firm's green products, green strategies, and the environmental performance advantages over competitors (Mishra et al., 2023; Rehman et al., 2024).

The validity and reliability of the questionnaire were assessed through expert reviews and a pre-test conducted with a small sample. The results confirmed the content validity and internal consistency of the instrument (Cronbach's alpha > 0.7) (Hair et al., 2017).

Procedure

Data were collected through an online survey distributed to the selected MSME managers. The survey link was sent via email, and reminders were issued to increase the response rate. After data collection, the responses were cleaned and checked for completeness, with incomplete or invalid responses excluded from the analysis.

Data Analysis

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with WarpPls software. PLS-SEM is ideal for this study due to its ability to estimate complex models involving multiple variables and mediating relationships (Hair et al., 2017). The analysis included both measurement and structural models to test the reliability, validity, and relationships between the latent variables.

Measurement Model: The measurement model was assessed using indicators such as factor loadings, composite reliability, and average variance extracted (AVE) to ensure convergent and discriminant validity (Fornell & Larcker, 1981).

Structural Model: The structural model was tested using bootstrapping techniques to evaluate the significance of the paths, and the hypotheses were tested based on the path coefficients and their significance (Hair et al., 2017).

Expected Outputs

The research aims to provide a comprehensive model explaining how ECSR, GSCM, and SCD influence GCA through the mediating role of TMC. The findings will contribute to the literature on sustainability and supply chain management, offering practical recommendations for MSMEs in Indonesia on how to integrate these practices to enhance their green competitiveness.

RESULTS AND DISCUSSION

Sample Characteristics

Table 1 provides a breakdown of the sample demographics from the 490 MSME managers surveyed across Pamekasan and Sampang. The sample included 300 male (61.2%) and 190 female (38.8%) respondents. In terms of age, the majority (39.2%) of respondents were between 40–49 years, followed by those aged 30–39 (28.4%) and 50–59 (16.5%). The education level of respondents was diverse, with most having completed high school (34.7%), followed by undergraduate (32.4%) and postgraduate (18.3%) qualifications. Experience varied, with 52.2% of respondents having 10–20 years in management roles, while 47.8% had more than 20 years of experience.

Validity and Reliability Testing

The validity of the measurement model was confirmed through factor loadings, all exceeding the .70 threshold (Hair et al., 2017). The composite reliability scores for the latent variables ranged from 0.89 to 0.93, indicating high internal consistency. The Average Variance Extracted (AVE) values for each variable were above 0.50, indicating good convergent validity (Hair et al., 2017). Table 2 summarizes the reliability and validity results.

Table 1.
Validity and Reliability of Variables

Variables	Cronbach's Alpha	AVE	Composite Reliability
ECSR	0.92	0.63	0.94
GSCM	0.91	0.61	0.93
SCD	0.90	0.58	0.92
TMC	0.93	0.65	0.94
GCA	0.94	0.62	0.95

Model Fit

The goodness-of-fit indices for the model indicate an excellent fit. The Standardized Root Mean Squared Residual (SRMR) was 0.07, well below the recommended threshold of 0.08, confirming the adequacy of the model fit (Hair et al., 2017). Additionally, the Normed Fit Index (NFI) was 0.91, exceeding the required value of 0.90, and the Chi-Square value was 3.57, indicating a good model fit. These results suggest that the hypothesized relationships between variables are well-supported by the data (Hair et al., 2017).

Table 2
Model Fit Indices

Fit Index	Threshold Criteria	Saturated Model	Interpretation
SRMR	< 0.08	0.07	Model Fit
NFI	> 0.90	0.91	Model Fit
Chi-Square	< 5	3.57	Model Fit

Hypothesis Testing

Table 3
Path Coefficients

	Environmental Corporate Social Responsibility (ECSR)	Green Supply Chain Management (GSCM)	Supply Chain Digitalization (SCD)	Top Management Commitment (TMC)
Top Management Commitment (TMC)	0.649 P<<0.001	0.147 P<<0.001	0.117 P<0.004	
Green Competitive	0.675 P<<0.001	0.033 P<0.235	0.076 P<0.044	0.147 P<<0.001

Advantage (GCA)	

Source: Primary data, processed 2025.

Based on Table 1.20, here is a detailed analysis of the seven relationships between variables tested using path coefficients and p-values:

The Influence of Environmental Corporate Social Responsibility (ECSR) on Top Management Commitment (TMC)

Environmental Corporate Social Responsibility (ECSR) has a positive impact on Top Management Commitment (TMC) with a path coefficient of 0.649 ($p < 0.001$). The very small p-value indicates that this relationship is highly significant, suggesting that the implementation of good corporate social responsibility practices supports top management commitment.

The Influence of Green Supply Chain Management (GSCM) on Top Management Commitment (TMC)

Green Supply Chain Management (GSCM) has a positive impact on Top Management Commitment (TMC) with a path coefficient of 0.147 ($p < 0.001$). This relationship is also highly significant, confirming that green supply chain practices strengthen top management commitment.

The Influence of Supply Chain Digitalization (SCD) on Top Management Commitment (TMC)

Supply Chain Digitalization (SCD) has a positive impact on Top Management Commitment (TMC) with a path coefficient of 0.117 ($p < 0.004$). This influence is highly significant, indicating that supply chain digitalization also plays an important role in enhancing top management commitment.

The Influence of Environmental Corporate Social Responsibility (ECSR) on Green Competitive Advantage (GCA)

Environmental Corporate Social Responsibility (ECSR) has a positive impact on Green Competitive Advantage (GCA) with a path coefficient of 0.675 ($p < 0.001$). This indicates that the implementation of environmentally friendly social practices has a significant impact in supporting green competitiveness.

The Influence of Green Supply Chain Management (GSCM) on Green Competitive Advantage (GCA)

Green Supply Chain Management (GSCM) has a positive impact on Green Competitive Advantage (GCA) with a path coefficient of 0.033 ($p = 0.235$). The p-value greater than 0.05 indicates that this relationship is not statistically significant.

The Influence of Supply Chain Digitalization (SCD) on Green Competitive Advantage (GCA)

Supply Chain Digitalization (SCD) has a positive impact on Green Competitive Advantage (GCA) with a path coefficient of 0.076 ($p = 0.044$). The p-value close to 0.05 indicates an insignificant relationship, although it still shows a positive, albeit limited, impact.

The Influence of Top Management Commitment (TMC) on Green Competitive Advantage (GCA)

Top Management Commitment (TMC) has a positive impact on Green Competitive Advantage (GCA) with a path coefficient of 0.147 ($p < 0.001$). The very small p-value indicates that top management commitment has a significant impact on green competitiveness.

Overall, the most significant relationships are between ECSR, GSCM, and SCD with TMC and GCA, indicating that the implementation of good social responsibility and sustainability practices strongly supports resilience to change and organizational sustainability. The relationship between SCRes and Green is also highly significant, suggesting that resilience to strategic changes plays a crucial role in driving sustainability.

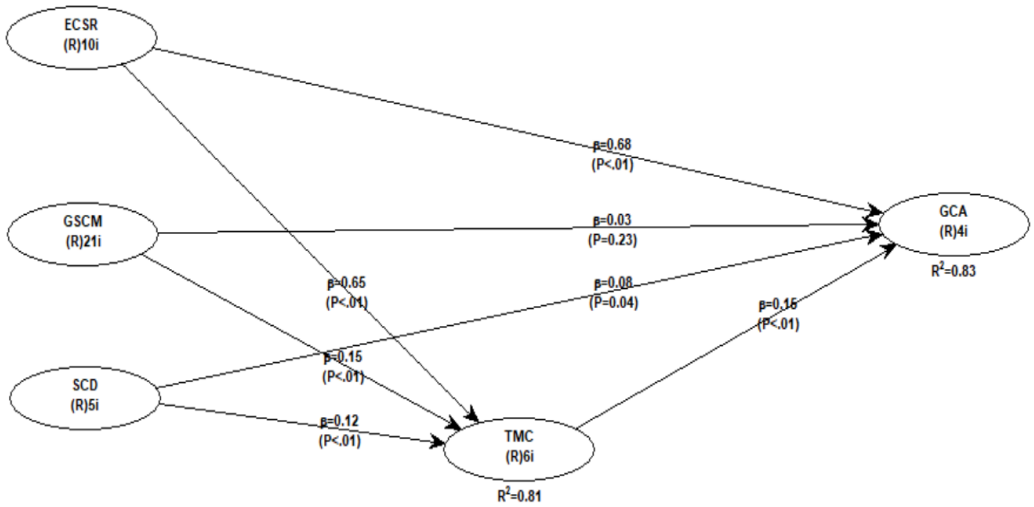

Figure 1.
Path Coefficient

The Influence of Environmental Corporate Social Responsibility (ECSR) on Top Management Commitment (TMC)

In this study, the relationship between Environmental Corporate Social Responsibility (ECSR) and Top Management Commitment (TMC) was analyzed using a path coefficient of 0.649 with a very small p-value ($p < 0.001$). This indicates that the influence of ECSR on TMC is highly significant and positive. In other words, the application of good corporate social responsibility practices, including activities related to environmental preservation, directly strengthens top management's commitment to achieving organizational sustainability goals. These findings align with previous studies showing that managerial commitment to sustainability and CSR practices are highly related and mutually reinforcing (Nurasyiah et al., 2024; Shandy et al., 2023). ECSR involves corporate participation in social and environmental activities that aim not only for profit but also to create positive impacts on society and the environment, motivating top management to give more attention to sustainability in strategic decision-making. Studies by Zhang et al. (2019) and Liu (2024) also emphasize the importance of management's commitment to integrating ECSR policies into corporate strategy, which directly impacts sustainability and competitive advantage in the market (Zea Barahona et al., 2024).

Furthermore, this research supports previous findings showing that companies with more committed management to ECSR practices are more likely to adopt and implement sustainable environmental policies, enhancing their corporate image and strengthening their long-term competitive advantage (Rehman et al., 2024). This highlights the essential role of ECSR in building strong connections between sustainability practices and managerial performance, as well as decision-making focused on sustainability.

The implication for companies is the need to strengthen the integration of ECSR policies and managerial commitment to ensure successful implementation of environmental policies that positively affect operational performance and company reputation. However, a limitation of this study is that it only includes specific companies, which may affect the generalization of the findings. Future research should explore different industry sectors to determine whether similar results are broadly applicable (Saputra & Kunaifi, 2024).

The Influence of Green Supply Chain Management (GSCM) on Top Management Commitment (TMC)

In this study, the relationship between Green Supply Chain Management (GSCM) and Top Management Commitment (TMC) was analyzed with a path coefficient of 0.147 and a very small p-value ($p < 0.001$). This shows a positive and highly significant influence, indicating that implementing green supply chain management practices can strengthen top management's commitment to the company's environmental policies and goals. GSCM practices include initiatives aimed at reducing environmental impacts throughout the supply chain, such as using eco-friendly raw materials, efficient waste management, and reducing greenhouse gas emissions. This commitment is crucial as it can improve the company's reputation in terms of sustainability and enhance its competitiveness in a market increasingly focused on environmental issues (Ahmed et al., 2023; Khaksar et al., 2016).

These findings are supported by prior research showing that good green supply chain management not only provides environmental benefits but also strengthens top management's long-term commitment to supporting sustainability initiatives (Zhang et al., 2019; Liu, 2024). Furthermore, Shandy et al. (2023) explained that top management committed to GSCM is more likely to systematically implement sustainability policies throughout the company's operations, improving overall organizational performance. GSCM helps companies not only comply with environmental regulations but also create long-term value by increasing operational efficiency and strengthening relationships with sustainability-conscious consumers (Adiatmaja et al., 2025).

Therefore, companies that effectively implement GSCM can strengthen top management's commitment to sustainability principles, which not only involves environmental preservation but also includes strategic advantages in terms of corporate reputation and financial performance (Anwar et al., 2025). However, a limitation of this study is that it only includes companies focused on green practices, so the results should be further explored in more diverse industrial sectors.

The Influence of Supply Chain Digitalization (SCD) on Top Management Commitment (TMC)

In this study, the influence of Supply Chain Digitalization (SCD) on Top Management Commitment (TMC) was analyzed using a path coefficient of 0.117 with a very significant p-value ($p < 0.004$). The results show that supply chain digitalization (SCD) has a significant positive effect on top management commitment. Supply chain digitalization

includes the application of information technology and digital systems to support the efficient management of goods and information flow, which can accelerate strategic and operational decision-making (Rosyid et al., 2021). This facilitates top management's responsiveness to market demand changes and external pressures, as well as improves cross-functional integration within the organization.

These findings align with previous studies showing that supply chain digitalization increases operational efficiency and strengthens managerial commitment to sustainability and company performance (Wang & Prajogo, 2024; Zhou et al., 2023). SCD plays a key role in optimizing supply chain performance by providing a platform for data transparency, better collaboration among stakeholders, and improved delivery time and product quality. For example, digitalization allows management to monitor supply chain performance in real-time and make data-driven decisions (Zhu et al., 2013). Additionally, digitalization strengthens top management's commitment to resource management and environmental innovation, which is increasingly important in the face of global sustainability demands (Yang et al., 2013; Cheng et al., 2025).

This research shows that digitalization not only benefits operational efficiency but also significantly impacts top management's commitment to continue supporting strategic initiatives leading to better performance and company sustainability (Kunaifi & Qomariyah, 2021). Supply chain digitalization also provides a competitive edge by improving response to market changes and more dynamic customer demand.

However, the limitation of this study is that supply chain digitalization may not directly affect all types of companies, and further research is needed in industries with varying levels of digital maturity.

The Influence of Environmental Corporate Social Responsibility (ECSR) on Green Competitive Advantage (GCA)

In this study, the influence of Environmental Corporate Social Responsibility (ECSR) on Green Competitive Advantage (GCA) was analyzed using a path coefficient of 0.675 and a very small p-value ($p < 0.001$). The results show that implementing environmentally friendly social practices within the scope of corporate social responsibility significantly impacts the company's green competitiveness. This indicates that companies effectively implementing ECSR policies not only gain benefits in terms of reputation and corporate image but also enhance their competitive advantage in a market increasingly concerned with environmental issues (Shandy et al., 2023; Zhang et al., 2019).

ECSR, which includes activities such as waste management, energy efficiency, and support for sustainability initiatives, directly impacts the company's environmental performance and supports creating value distinct from competitors. Companies committed to ECSR tend to build a more positive image in the eyes of consumers and other stakeholders, strengthening their competitive position. This aligns with findings by Rehman et al. (2024), which show that companies proactive in adopting sustainability practices achieve greater competitive advantage through improved customer trust and stronger brand loyalty (Kunaifi & Syam, 2021).

Furthermore, this result confirms that ECSR acts as a main driver in achieving Green Competitive Advantage, where companies engaged in sustainability practices are more likely to adopt green innovations and improve their operational performance (Khaksar et al., 2016; Cheng et al., 2025).

Overall, this study provides strong evidence that ECSR implementation is not just a moral or social obligation but also a business strategy that enhances a company's sustainable competitiveness. However, a limitation of this study is that it only involves certain sectors, so further research is needed to explore its impact across broader industries.

The Influence of Green Supply Chain Management (GSCM) on Green Competitive Advantage (GCA)

The influence of Green Supply Chain Management (GSCM) on Green Competitive Advantage (GCA) showed statistically insignificant results with a path coefficient of 0.033 ($p = 0.235$), greater than 0.05, indicating that the relationship between these two variables is not strong enough to be considered significant. One factor that may explain this result is the varying level of implementation and consistency of GSCM practices across companies. Based on respondent perceptions, the average score for the GSCM variable is 2.79, indicating that although companies have begun implementing some green practices in their supply chains, there is still much room for improvement in the implementation of more effective and measurable green strategies (Zhang et al., 2019; Liu, 2024).

Practices such as environmental audits conducted on suppliers, waste management, and optimizing production processes to reduce environmental impact received relatively low average scores, reflecting that GSCM implementation is still not optimal or well-structured in many companies (Kunaifi, 2024). Therefore, even though some companies have made efforts to improve sustainability through GSCM, the results are not profound enough to significantly enhance their green competitiveness.

Additionally, demographic factors identified in this study, such as company age, owner experience, and education level, may also play a role in hindering the potential positive influence of GSCM on GCA. For example, younger companies (as found among the majority of respondents) may prioritize innovation and sustainability but may not have the resources or established systems to support consistent and effective GSCM implementation (Suharti & Sirine, 2012). In contrast, older companies may be more tied to established methods, hindering the adoption of more aggressive and innovative GSCM practices. These findings are supported by references showing that while GSCM has the potential to enhance competitiveness, barriers in implementation and differences in readiness to adopt sustainability principles often affect the final outcome (Mishra & Yadav, 2021; Cheng et al., 2025).

The Influence of Supply Chain Digitalization (SCD) on Green Competitive Advantage (GCA)

Supply Chain Digitalization (SCD) has become an increasingly important factor in creating environmentally friendly competitive advantages across industries. This study shows that SCD has a positive influence on Green Competitive Advantage (GCA) with a path coefficient of 0.076 and a p-value of 0.044, indicating a significant relationship between the two variables. The p-value approaching 0.05 shows that SCD has a direct impact that can influence the company's green competitiveness.

Digitalization in the supply chain allows companies to optimize operational processes and reduce carbon footprints by using more efficient information technologies, such as big data analytics, Internet of Things (IoT), and automation in production and distribution processes. This not only accelerates the flow of goods but also ensures more efficient use of resources, which in turn strengthens the company's competitive position in a market

increasingly demanding sustainability (Wang & Prajogo, 2024). By speeding up the digital-based processes, companies can reduce production and distribution times, which can reduce carbon emissions and waste, and enhance responsiveness to more environmentally friendly market demands (Zhou et al., 2023).

This study also supports previous findings showing that adopting digital technology in the supply chain not only increases operational efficiency but also helps companies meet increasingly strict sustainability standards, which are one of the pillars in building Green Competitive Advantage (Khaksar et al., 2016). This is consistent with the study by Zhang et al. (2019), which showed that companies adopting green innovations driven by digitalization have better environmental performance, which ultimately provides a greater competitive advantage in the global market (Kunaifi et al., 2025).

In this context, it is essential for companies to continue investing in digital technologies that support sustainability, both in supply chain management, waste reduction, and improving operational transparency. This research also indicates that companies successfully integrating digitalization into their operations not only gain economic benefits but also solidify their position as leaders in sustainability within their respective industries.

The Influence of Top Management Commitment (TMC) on Green Competitive Advantage (GCA)

Top Management Commitment (TMC) has a significant influence on Green Competitive Advantage (GCA) in this study, with a path coefficient of 0.147 and a very small p-value ($p < 0.001$). This indicates that a strong commitment from top management to implement environmentally friendly business practices can enhance the company's green competitiveness. Top management commitment is seen as a key driver in integrating sustainability into the company's strategy and operations, ultimately improving the company's competitive advantage in a market increasingly concerned with environmental issues (Ahmed et al., 2023).

Top management plays a vital role in mobilizing resources and setting strategic directions related to the company's sustainability. Research by Rehman et al. (2024) revealed that top management's commitment to green initiatives not only affects strategic decision-making but also motivates the entire organization to engage in environmentally friendly practices. This is reflected in the implementation of policies supporting green innovation and more sustainable supply chain management, which can strengthen the company's competitive position in industries focused on environmental aspects (Khaksar et al., 2016).

This study also supports the view expressed by Cheng et al. (2025), who emphasized that top management commitment plays a significant role in improving green innovation and company performance, both environmentally and financially. Policies led by top management send a strong signal to stakeholders about the importance of sustainability, which in turn strengthens the company's image as a leader in environmentally friendly business practices (Zhang et al., 2019).

Furthermore, top management commitment is also key in ensuring the sustainability of these practices in the long term. With full support from management, companies are more likely to invest in green technologies and strategies that reduce environmental impact, which directly impacts their performance and competitiveness in the increasingly competitive global market (Liu, 2024).

CONCLUSION

This study provides an in-depth understanding of how sustainability practices can enhance a company's competitiveness in facing market challenges that increasingly prioritize environmental issues. Several key findings from this research show that sustainability-focused policies have a positive impact on top management commitment and corporate competitiveness.

First, the implementation of Environmental Corporate Social Responsibility (ECSR) has been shown to have a significant influence on managerial commitment to sustainability. Good ECSR practices, involving companies in social and environmental activities, not only improve the company's image but also strengthen managerial commitment to supporting sustainability goals. This suggests that companies integrating social and environmental responsibility into their strategies are more likely to make decisions that support long-term sustainability and gain a competitive advantage in the market.

Next, the implementation of Green Supply Chain Management (GSCM) also has a significant positive impact on managerial commitment to sustainability. GSCM practices, such as using environmentally friendly raw materials and efficient waste management, reinforce managerial commitment to supporting the company's environmental policies and goals. However, despite the positive influence, the varying implementation of GSCM across companies shows that there is still room for improvement in adopting more structured and effective green strategies.

Supply Chain Digitalization (SCD) also plays an important role in enhancing the company's green competitiveness. The use of digital technologies to improve operational efficiency and respond to market demand, which is increasingly focused on sustainability, helps companies manage resources more efficiently and reduce their carbon footprint. Digitalization enables companies to increase transparency and collaboration within the supply chain, thereby strengthening their competitive position.

Finally, top management commitment is a key factor in the successful implementation of sustainability policies. Management committed to sustainability can mobilize resources and set strategic directions that support environmentally friendly practices. This study shows that companies with strong top management commitment are more likely to implement sustainability-supporting policies, which ultimately improves their competitiveness in markets that increasingly prioritize sustainability.

Overall, the findings of this study indicate that ECSR, GSCM, and SCD play important roles in enhancing a company's Green Competitive Advantage. Success in integrating sustainability principles into managerial and operational practices can provide long-term competitive advantages, strengthen the company's reputation, and improve environmental performance and efficiency. However, limitations in the scope of industry sectors suggest the need for further research to better understand the impact of sustainability practices across a wider range of industries.

Funding: Directorate of Research, Technology, and Community Service, Ministry of Education, Culture, Research and Technology. According to the Research Program Implementation Contract. Number: Based on the Decree No. 0070/C3/AL.04/2025 and the agreement/contract numbers 128/C3/DT.05.00/PL/2025; 036/LL7/DT.05.00/PL/2025; 156/E.02/UNIRA-LPPM/VI/2025.

Acknowledgment
The entire author team would like to express their gratitude to all parties who have supported this research, especially the funders: Directorate of Research, Technology, and Community Service, Ministry of Education, Culture, Research and Technology. According to the Research Program Implementation Contract. Number: Based on the Decree No. 0070/C3/AL.04/2025 and the agreement/contract numbers 128/C3/DT.05.00/PL/2025; 036/LL7/DT.05.00/PL/2025; 156/E.02/UNIRA-LPPM/VI/2025.

REFERENCES

Adiatmaja, F. S., Ushada, M., & Purwadi, D. (2025). Environmental Ergonomic Analysis in MSMEs of 'Karak' using Working Environment Approach, HIRARC, and Kansei Engineering. *agriTECH*, *45*(2), 113. https://doi.org/10.22146/agritech.79984

Anwar, D. R., Sumarlin, S., & Abdullah, W. (2025). Reconstructing Revenue Management Ethics in Islamic Finance: A Maqashid-Based Integrity Model and Empirical Framework. *Formosa Journal of Applied Sciences*, *4*(6), 1743–1762. https://doi.org/10.55927/fjas.v4i6.177

Ahmed, R. R., Akbar, W., Aijaz, M., Channar, Z. A., Ahmed, F., & Parmar, V. (2023). The role of green innovation on environmental and organizational performance: Moderation of human resource practices and management commitment. Heliyon, 9(1), e12679. https://doi.org/10.1016/j.heliyon.2023.e12679

Chatzoudes, D., & Chatzoglou, P. (2023). Antecedents and effects of green supply chain management (GSCM) practices. Benchmarking: An International Journal, 30(10), 4014–4057. https://doi.org/10.1108/BIJ-09-2021-0524

Cheng, Q., Lin, A. P., & Yang, M. (2025). Green innovation and firms' financial and environmental performance: The roles of pollution prevention versus control. Journal of Accounting and Economics, 79(1), 101706. https://doi.org/10.1016/j.jacceco.2024.101706

Isbahi, M. B., Zuana, M. M. M., & Toha, M. (2024). The Multi-Social Relation of the Cattle Industry in the Plaosan Subdistrict Animal Market of Magetan Regency. *Malacca: Journal of Management and Business Development* , *1*(1), 31–46. https://doi.org/10.69965/malacca.v1i1.51

Khaksar, E., Tayyebeh, A., Ahmad, E., & Tamošaitienė, J. (2016). The effect of green supply chain management practices on environmental performance and competitive advantage: A case study of the cement industry. Technological and Economic Development of Economy, 22(2), 293–308. https://doi.org/10.3846/20294913.2015.1065521

Kunaifi, A. (2024). *Islamic Entrepreneurship: Identitas gerakan ekonomi Islam komunitas hijrah di Indonesia*. PT Literasi Nusantara.

Kunaifi, A., Djamaluddin, B., Fauzia, I. Y., Syam, N., & Widiastuti, T. (2025). Conservative-Political Global Islamic Economy Movement, Face of Entrepreneurship Constructivism of The Indonesian Hijra Community. *IQTISHODUNA: Jurnal Ekonomi Islam*, *14*(2), 531–550.

Kunaifi, A., & Qomariyah, L. (2021). Developing Company Images Through Spiritual Public Relations Facing Covid-19 Outbreak. *Jurnal Iqtisaduna*, *1*(1), 13. https://doi.org/10.24252/iqtisaduna.v1i1.15808

Kunaifi, A., & Syam, N. (2021). Business Communication in Developing the Halal Tourism Industry. *Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE)*, *4*(1), 1–17. https://doi.org/10.31538/iijse.v4i1.1305

Liu, L. (2024). Green innovation, firm performance, and risk mitigation: Evidence from the USA. Environmental Development and Sustainability, 26(9), 24009–24030. https://doi.org/10.1007/s10668-023-03632-z

Nurasyiah, A., Syamputri, D., Al Adawiyah, R. A., Mahri, A. J. W., & Ismail, A. G. (2024). Islamic wealth management: Ensuring the prosperity of Muslim households of MSMEs during Covid-19. International Journal of Ethics in Systems, 40(1), 189–211. https://doi.org/10.1108/IJOES-09-2021-0165

Rehman, S. U., Chan, M. P., Almakhayitah, M. Y., Albakhit, A. I. A., & Abdou, A. H. (2024). Going green! Factors influencing green competitive advantage of Chinese SMEs: A moderated-mediated perspective. Environmental Science and Pollution Research, 31(10), 15302–15320. https://doi.org/10.1007/s11356-024-32099-2

Rosyid, Abd., Kunaifi, A., & Asyari, Q. (2021). Corporate Spiritual Leadership: Model Kepemimpinan Bisnis Era Milenial dalam Menciptakan Great Corporate. *Transparansi : Jurnal Ilmiah Ilmu Administrasi*, *4*(1), 85–93. https://doi.org/10.31334/transparansi.v4i1.1609

Saeed, M. (2024). Environmental Governance, Big Data Analytics, and SDG Performance: A PLS-SEM Analysis of SMEs in ASEAN Economies. *iRASD Journal of Management*, *6*(4), 218–233. https://doi.org/10.52131/jom.2024.0604.0135

Saputra, T. A., & Kunaifi, A. (2024). *Islamic Economic Politics And Policy For The Use Of Artificial Intelligence In The Defense Sector*. *7*(3).

Shandy, V. M., Asep, M., & Harsanto, B. (2023). Social media richness, brand equity, and business performance: An empirical analysis of food and beverage SMEs. Cogent Business & Management, 10(2), 2244211. https://doi.org/10.1080/23311975.2023.2244211

Wang, M., & Prajogo, D. (2024). The effect of supply chain digitalization on a firm's performance. Industrial Management & Data Systems, 124(5), 1725–1745. https://doi.org/10.1108/IMDS-09-2023-0629

Waris, I., Suki, N. M., Ahmed, A., & Barkat, W. (2024). Environmental corporate social responsibility initiatives and green customer citizenship behavior in tourism industry: The mediating roles of green trust, customer-company identification, and green corporate image. Social Responsibility Journal, 20(6), 1138–1156. https://doi.org/10.1108/SRJ-07-2023-0378

Zainurrafiqi, Z., Gazali, G., Risal, Z., Hakim, R., Rusdiyanto, R., & Asyik, N. F. (2024). Organizational Resilience, Strategic Foresight, and Green Supply Chain Integration: A Pathway to Sustainable Performance in MSMEs Through Green Competitive Advantage. *Journal of Management World*, *2024*(4), 856–866. https://doi.org/10.53935/jomw.v2024i4.552

Zea Barahona, C. A., Campozano Villacreses, B. D., Delgado Alvia, K. Y., Guerra Lino, J. J., Loor Velez, M. D., & Reyes Velez, M. J. (2024). La Planificación Estratégica Y La Responsabilidad Social Corporativa. *Ciencia y Desarrollo*, *27*(3), 303. https://doi.org/10.21503/cyd.v27i3.2693

Zhang, D., Rong, Z., & Ji, Q. (2019). Green innovation and firm performance: Evidence from listed companies in China. Resources, Conservation and Recycling, 144, 48–55. https://doi.org/10.1016/j.resconrec.2019.01.023

Zhou, H., Wang, Q., Li, L., Teo, T. S. H., & Yang, S. (2023). Supply chain digitalization and performance improvement: A moderated mediation model. Supply Chain Management: An International Journal, 28(6), 993–1008. https://doi.org/10.1108/SCM-11-2022-0434